

Set	Items	Description
S1	13661	LAPLACE OR SIGNUM OR (FAST OR DIGITAL) () FOURIER () TRANSFORM? OR FFT OR DFT OR FOURIER () TRANSFORM?
S2	20006	(DIGITAL OR ELECTRONIC) (2W) (WATERMARK? OR WATER () MARK?) OR WATERMARK? OR WATER () MARK? OR TRANSLUCENT () DESIGN?
S3	8767594	FILTER? OR LOOKUP OR LOOK () UP OR SEARCH? OR SEEK? OR QUER? OR MATCH? OR QUEST? OR PURSU? OR FIND? OR RETRIEV? OR EXTRACT? OR SEPARATE? OR DIFFERENTIAT? OR SCREEN? OR PREFILTER? OR PR- E () FILTER?
S4	4866795	DETECT? OR DETERMIN? OR DECID? OR RESOLV? OR ASCERTAIN? OR RECOGNI?
S5	36	S1 (S) S2
S6	11	S5 (S) S3
S7	0	S6 (S) S4
S8	36	S5 OR S6
S9	0	S8 NOT PY>1995
File	15:ABI/Inform(R)	1971-2004/Aug 12 (c) 2004 ProQuest Info&Learning
File	810:Business Wire	1986-1999/Feb 28 (c) 1999 Business Wire
File	647:CMP Computer Fulltext	1988-2004/Aug W1 (c) 2004 CMP Media, LLC
File	275:Gale Group Computer DB(TM)	1983-2004/Aug 12 (c) 2004 The Gale Group
File	674:Computer News Fulltext	1989-2004/Jul W4 (c) 2004 IDG Communications
File	696:DIALOG Telecom. Newsletters	1995-2004/Aug 11 (c) 2004 The Dialog Corp.
File	621:Gale Group New Prod. Annou. (R)	1985-2004/Aug 12 (c) 2004 The Gale Group
File	636:Gale Group Newsletter DB(TM)	1987-2004/Aug 12 (c) 2004 The Gale Group
File	813:PR Newswire	1987-1999/Apr 30 (c) 1999 PR Newswire Association Inc
File	613:PR Newswire	1999-2004/Aug 12 (c) 2004 PR Newswire Association Inc
File	16:Gale Group PROMT(R)	1990-2004/Aug 12 (c) 2004 The Gale Group
File	160:Gale Group PROMT(R)	1972-1989 (c) 1999 The Gale Group
File	553:Wilson Bus. Abs. FullText	1982-2004/Jul (c) 2004 The HW Wilson Co

US-PAT-NO: 5488664
 DOCUMENT-IDENTIFIER: US 5488664 A
 TITLE: Method and apparatus for protecting visual info with printed cryptographic watermarks

----- KWIC -----

US Patent No. - PN (1):
 5488664

Brief Summary Text - BSTX (10):

The purpose of the invention is to produce a printed watermark which provides reasonable security against unauthorized access to and modification of visual information at very low costs. The cryptographic printed watermark of the invention can be produced by standard laser or ink-jet printers and verified directly by the human visual system without using any cryptographic knowledge, computational devices or chemical processes. The watermark consists of an array of printed shapes which appears to be random, and the device consists of another array of printed shapes, which also appears to be random, printed on a transparent medium. When the transparent developer is placed over the printed watermark, a hidden image becomes clearly visible.

Detailed Description Text - DETX (2):

With reference to the drawings which illustrate a typical watermark developer and various pixels and subpixels, FIG. 1a illustrates an array of subpixels forming a typical printed watermark and FIG. 1b illustrates an array of subpixels forming a typical printed developer. The hidden image is completely invisible in each of the two arrays. If FIG. 1b is photocopied onto a transparency 2 and then placed on top of and aligned with sheet 4 of the watermark printed thereon, FIG. 1a, as shown in FIG. 1c, a viewer looking through FIG. 1b of the transparency, illustrating the developer, onto the watermark, sees the hidden image of a circle 6, which is the image encoded in the apparently random array of shapes that makes up FIGS. 1a and 1b. The subpixels of the arrays of FIGS. 1a and 1b are rectangles each composed of two black subpixels and two white subpixels.

Detailed Description Text - DETX (8):

Another embodiment of the invention allows images to be concealed. For example, a first sheet of material may be printed with an image of, for example, a house. A second transparent sheet of material may be printed with an image of, for example, a dog. The developer (transparency) image may be superimposed on the watermark image of the house and a hidden image may be seen with no trace of either the house or the dog being visible. To construct such a scheme, a more complex collection of 2.times.2 subpixel subarrays having two black subpixels is used, as shown in FIGS. 4a to 4l. In the individual subarrays having two black subpixels are considered to be white and subarrays having three black subpixels are considered to be black. In the superimposed image, subarrays having three black subpixels are considered to be white.



United States Patent [15]

[11] Patent Number: 5,488,664
 [45] Date of Patent: Jan. 30, 1996

[54] METHOD AND APPARATUS FOR PROTECTING VISUAL INFORMATION WITH PRINTED CRYPTOGRAPHIC WATERMARKS

943691 10/1993 United Kingdom
 950976 01/1994 United Kingdom
 2178520 10/1995 United Kingdom 3402 1503

Primary Examiner—Bernard E. Gregory
 Attorney Agent, or Firm—Kirk, Mallin & Coe

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[21] Appl. No: 251,933

[22] Filed: Apr. 23, 1994

[51] Int. Cl.³ G09C 5/00

[52] U.S. Cl. 380/24; 380/25; 380/26; 380/27; 380/28; 380/29; 380/30; 380/31; 380/32; 380/33; 380/34; 380/35; 380/36; 380/37; 380/38; 380/39; 380/40; 380/41; 380/42; 380/43; 380/44; 380/45; 380/46; 380/47; 380/48; 380/49; 380/50; 380/51; 380/52; 380/53; 380/54; 380/55; 380/56; 380/57; 380/58; 380/59; 380/60; 380/61; 380/62; 380/63; 380/64; 380/65; 380/66; 380/67; 380/68; 380/69; 380/70; 380/71; 380/72; 380/73; 380/74; 380/75; 380/76; 380/77; 380/78; 380/79; 380/80; 380/81; 380/82; 380/83; 380/84; 380/85; 380/86; 380/87; 380/88; 380/89; 380/90; 380/91; 380/92; 380/93; 380/94; 380/95; 380/96; 380/97; 380/98; 380/99; 380/100

[58] Field of Search: 380/24, 4, 23, 51, 380/34, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

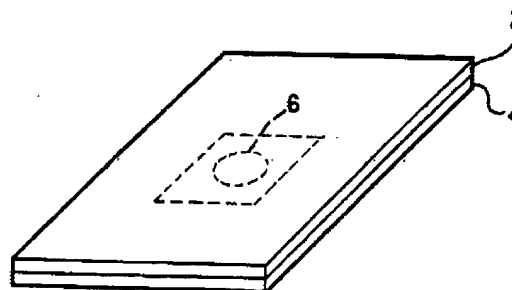
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18 Claims, 4 Drawing Sheets



----- KWIC -----

tract Text - ABTX (1):

physical medium is encoded with machine readable information that provides a human interface to a computer system. The information encoded into the medium indicates a computer implemented process, and is encoded according to a digital encoding scheme, such as encoding by modifying color values of a digital image or other image printed on the medium. For example, a digital watermark or steganographic data hidden in the image indicates a web page. In response to the user selecting the encoded information area, the machine-readable information is decoded, and used to invoke a computer implemented process.

ailed Description Text - DETX (271):

A major improvement to the nominal knot pattern system previously described directly addresses practical difficulties (1), the inefficient covering, (2) the unwanted visibility of the rings, and (6) the need for higher levels of security. This improvement also indirectly addresses item (4) the overlap issue, which has been discussed in the last paragraph. This major improvement follows the following: just prior to the step where the mosaic of the encoded patterns is added to an original image to produce a distributable image, a mosaic of encoded knot patterns, 866, is spatially filtered (using common techniques) by a standardized and (generally smoothly) random phase-contrast filter. It is very important to note that this phase-only filter is itself fully rotationally symmetric within the spatial frequency domain, and the filtering effects are fully rotationally symmetric. The effect of this phase-only filter on an individual luminous ring is to transform it into a smoothly varying pattern of concentric rings, not totally dissimilar to the pattern on water several instances after a pebble is dropped in, only the patterns are somewhat random in the case of this phase-only filter instead of the uniform periodicity of a pebble wave pattern. FIG. 20 attempts to show a rough (i.e. non-greyscale) depiction of these phase-only filtered patterns. The top figure of FIG. 20 is a cross section of a typical brightness profile 874 of one of these phase-only filtered ring patterns. The pattern referenced in the figure is the nominal location of the phase-filtered outer ring, 870. The center of an individual ring, 872, is referenced as the location at which the brightness profile is rotated in order to fully describe the two-dimensional brightness distribution of one of these filtered patterns. The bottom figure is a rough attempt to communicate the characteristics of the filtered patterns. It is depicted as 876, a crude greyscale image of the filtered ring. This phase-only filtered ring, 876 will can be referred to as a random ripple pattern.

15065175581

(1c) Patent No.: US 6,647,130 B2
(45) Date of Patent: Nov. 11, 2003

(58) Field of Search: 382/100, 112, 382/332, 254, 358/9, 28, 448, 450, 380/54, 231-234, 287, 285/73, 73, 93, 94, 113, 501; 348/473, 1; 235/454; 340/553, 5, 6, 5, 63, 5, 8, 5, 81, 5, 83; 358/73, 902/1, 4, 7, 712/73; 382/94; 705/2, 44, 345/760, 762, 764, 817, 836; 707/10, 104/1, 501/1, 513; 709/206, 217-219, 227, 236, 245, 252, 333, 378, 379

(55) **References Cited**

394,57: A 102974 Cross

(*) Notice: Subject to any disclaimer, the term of this print is extended or adjusted under 35 U.S.C. 156(b) by 6 days.

(21) Appl. No.: 187189, 187

(22) FGA: Jul 1, 2001

(55) **Prior Publication Deb**

US 2015/032341 A1 Feb. 12, 2015

Related U.S. Application Data

(53) Continuation of application No. 09/212,177. Filed on Feb. 6, 2003, which is a continuation of application No. 08/746,613, filed on Nov. 12, 1999, now U.S. Pat. 6,122,900, which is a continuation of application No. 08/746,613, filed on Nov. 12, 1999, now U.S. Pat. 6,122,900, and a continuation-in-part of application No. 08/708,083, filed on Oct. 21, 1997, now U.S. Pat. 5,841,978, which is a continuation-in-part of application No. 08/734,794, filed on May 6, 1995, now U.S. Pat. 5,432,297, and a continuation-in-part of application No. 08/727,626, filed on Oct. 21, 1994, now Pat. No. 5,799,626, and a continuation-in-part of application No. 08/225,289, filed on Jan. 17, 1994, now abandoned, said application No. 08/225,289, filed on Oct. 21, 1994, is a continuation-in-part of application No. 08/215,289, filed on Oct. 17, 1994, now abandoned, which is a continuation-in-part of application No. 08/144,866, filed on on Nov. 18, 1993, now abandoned.

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(List continued on next page.)

Primary Examiner—John L. Cooper

(4) Attorney Agent, of Firm—Joel R. Meyer; Dignitary Corporation

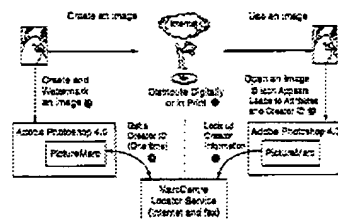
ABSTRACT

A physical medium is associated with machine readable information that provides a human interface to a computer system. The information associated with the medium indicates a computer implemented process, and is encoded according to a spatial encoding scheme, such as encoding by stroking other values of a graphic or other image printed on the medium. For example, a digital watermark or other signature data hidden in the image indicates a web page, in response to the user selecting the encoded information area, the machine readable information is decoded, and used to invoke a computer implemented process.

(51) Int. Cl.⁷ H04N 1/00

(33) U.S. Cr. 342786

19 Claims, 51 Drawing Sheets



Details Text Image HTML KWIC

Details Text Image HTML Full

5768,426 572336

DERWENT-ACC-NO: 2002-391425
DERWENT-WEEK: 200417
COPYRIGHT 1999 DERWENT INFORMATION LTD

TITLE: A method to embed and extract hidden digital watermark to protect the copyright of the original image embedding the watermarked image to the original through clockwise and counterclockwise DCT transformations

INVENTOR: SHIU, C; WU, J; HSU, C
PATENT-ASSIGNEE: CYBERLINK CORP[CYBEN]
PRIORITY-DATE: 1999TW-0112076 (July 16, 1999)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	EP
US 6700991 B1	March 2, 2004	N/A	00
TW 451171 A	August 21, 2001	N/A	00

APPLICATION-DATE:

PUB-NO	APPL-DESCRIPTOR	APPL-NO
US 6700991B1	N/A	2000US-0520058
TW 451171A	N/A	1999TW-0112076

INT-CL (IPC): G06K009/00, G06K009/46, G09C005/00

ABSTRACTED-PUB-NO: TW 451171A

BASIC-ABSTRACT:
NOVELTY - This invention discloses a method to embed hidden digital watermark. The method includes the following: an original image and a watermark image are provided. A scattered watermarked image is produced by randomly sorting the watermarked image. Then, the original image and the scattered watermarked image are sorted on the base of section to generate multiple original sections and the watermarked sections corresponding to the original sections through a determined sorting approach. The original image sections are DCT transformed clockwise to convert the sections to DCT coefficient sections corresponding to different frequency ranges. The watermark sections are embedded to the DCT coefficient sections of the original image sections within the determined frequency range to generate multiple combined DCT coefficient sections. Then, the combined DCT coefficient sections are transformed counterclockwise to produce an image with embedded watermark to protect the copyright of the original image.

CHOSEN-DRAWING: Dwg.1/1

TITLE-TERMS: METHOD EMBED EXTRACT HIDE DIGITAL WATERMARK PROTECT ORIGINAL IMAGE EMBED WATERMARK IMAGE ORIGINAL IMAGE THROUGH CLOCKWISE DCT TRANSFORM

Details Text Image HTML FULL

(11) United States Patent
Wu et al.

(10) Patent No.: **US 6,700,991 B1**
(45) Date of Patent: **Mar. 2, 2004**

(54) HIDDEN DIGITAL WATERMARKS IN IMAGES

(75) Inventor: **Je-Ling Wu, Taipei (TW); Chou-Ting Hsu, Taipei (TW)**

(73) Assignee: **Cyberlink Corporation, Taipei (TW)**

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 156(a) by 0 days.

(21) Appl. No.: 09/520,058

(22) Filed: **Mar. 7, 2000**

(30) Foreign Application Priority Data

No. 16, 1999 (TW) 8512076 A

(31) Int. Cl. 7: **G06K 9/00, G06K 9/46**

(32) U.S. Cl.: **342/108; 342/250**

(33) Field of Search: **342/108, 250**

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Whalen, "Image Authentication for a Slippery New Age", pp. 18, 19, 20, 22, 24, 26, 32, 34-37, Dr. Dobbs's Journal, Apr. 1993.

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Primary Examiner—Leo Rodriguez

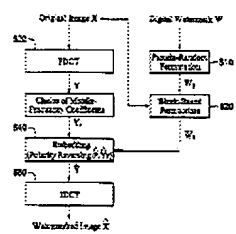
Assistant Examiner—Hossein Akbarzadeh

(74) Attorney, Agent, or Firm—Fitz & Richardson P.C.

(57) ABSTRACT

An image authentication method by embedding digital watermark into images, comprising providing an original image and a watermark image, applying pseudo-random permutations to the watermark image for generating a dispersed watermark image; applying block-based permutations to the original image and the dispersed watermark image in order to form a plurality of original image blocks with each of the watermark blocks dispersed over the corresponding image block only; applying FDCT (Forward Discrete Cosine Transform) on each of the original image blocks independently so that each of the original image blocks is transformed into a DCT coefficient block that corresponds to different frequency ranges; embedding said watermark image blocks into said DCT coefficient blocks, in order to form a plurality of combined DCT coefficient blocks; applying IDCT (Inverse Discrete Cosine Transform) to the combined DCT coefficient blocks to form an embedded watermark image.

10 Claims, 9 Drawing Sheets

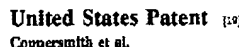


----- KWIC -----

Abstract Text - ABTX (1) :

A visible seal or label containing a serial number is placed in product on the product packaging. The visible label contains the serial number as a first public key encrypted version of the serial number. A second hidden label inside of the package has thereon a second a second encrypted version of the serial number made using a second public key. The hidden label may be secured inside of the package out of sight or may be placed on one of the visible label and therefore viewable through a transparent case, once opened or visible when peeled off. The private keys are known only to the manufacturer. Using a corresponding public key provided by the manufacturer, the consumer, law enforcement agent, or customs inspector can verify if the encrypted version matches the serial number. An advantage to this method is that only the manufacturer can produce matching pairs. Moreover, using a sales machine equipped with the public key the sales clerk can authenticate the product in front of the consumer at point of purchase. Additionally, in the case of a CD or other digital medium, the hidden label may comprise a digital watermark of the encrypted serial number such that a consumer, law enforcement agency, or customs inspector can readily detect a counterfeit product.

US Patent No. - PN (1) :
6069955



[21] Patent Number: 6,069,955
[35] Date of Patent: May 30, 2000

- [54] SYSTEM FOR PROTECTION OF GOODS
AGAINST COUNTERFEITING
- [75] Inventor: Don Coppensmith, Ossining; Claude
A. Greenleaf, Chappaqua; Charles P.
Tresser, Mamaroneck; Chai Wai
Ossining, all of N.Y.
- [79] Assignee: International Business Machines
Corporation, Armonk, N.Y.
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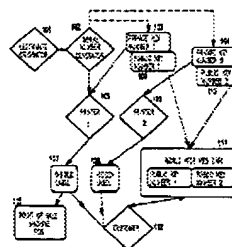
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57 ABSTRACT

A visible seal or label containing a serial number is placed on the plain view on the product packaging. The visible label contains the serial number as well as a free public key (encrypted version of the serial number). A second or hidden label is placed on the package but through a second or hidden label, a version of the serial number is encrypted with the public key. The hidden label may be secured inside the package out of sight or may be placed on the back of the visible label and therefore viewable through a transparent window. The hidden label contains the serial number and the keys are known only to the manufacturer. Using a corresponding public key provided by the manufacturer, the consumer, law enforcement agency, or persons responsible can determine the serial number of the product.

An advantage to this method is that only the manufacturer can produce matching pairs. Moreover, using a point of sale machine equipped with the public key the sales clerk can determine the serial number or, if desired, the digital signature of the product. Additionally, the use of a CD or other digital medium, the hidden label may comprise a digital version of the encrypted serial number such that a consumer, law enforcement agency, or customs inspector can readily determine the serial number.

17 Claims, 5 Drawing Sheets

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L Number	Hits	Search Text	DB	Time stamp
1	3	(("5488664") or ("6700991") or ("6069955")).PN.	USPAT	2004/08/19 20:59
2	11	("5208857" "5323187" "5809139" "5864649" "5930369" "6185312" "6240121" "6285775" "6317767" "6373974" "6560370").PN.	USPAT	2004/08/19 20:59
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